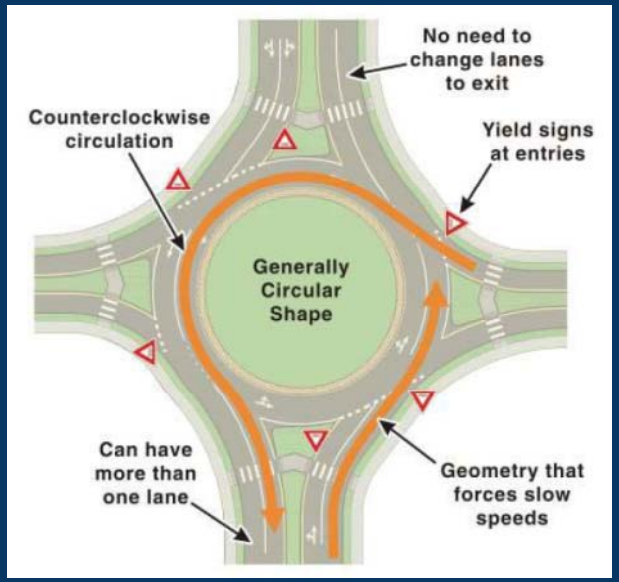
Roundabouts on the State Highway System

Presentation by Caltrans District 5 at SBCAG North County Subregional Meeting, May 4, 2011
Adapted from 0R750 Project Open House by Paul Valadao

What are Roundabouts?

- Modern roundabouts are circular intersections:
  - Promote safe/efficient traffic flow
  - Traffic moves in one direction
  - Circulating traffic has right of way
  - Channelized approaches
  - Slower entry speeds
  - Entering traffic yields
  - Lower number of conflict points
  - Accommodate peds/bikes



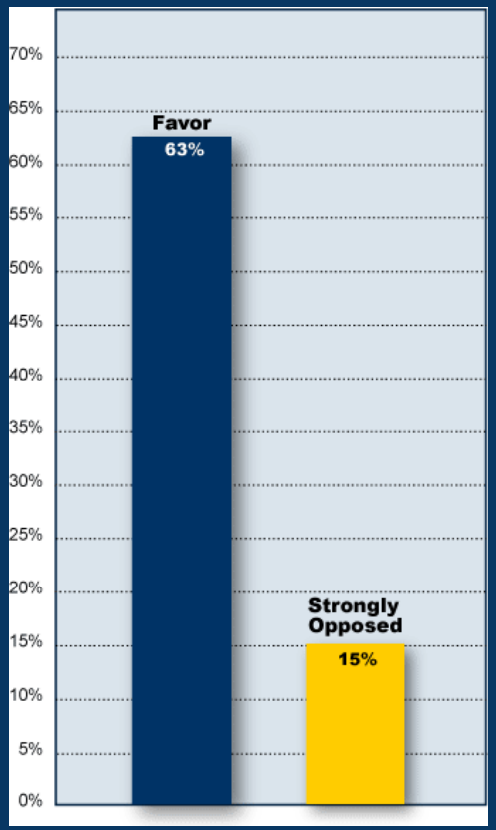
Public Opinion of Roundabouts

Anxious at the thought of driving a roundabout?

You mean I now have to stop?

After driving roundabouts most are in favor of them

Anticipate slowing but not being delayed



Benefits of a Roundabout

- Increase safety
- Increase capacity / reduce delay
- Accommodate larger vehicles
- Less maintenance
- Reduce vehicle emissions
- Reduce construction and right of way cost

Safety of a Roundabout

- Roundabouts are a proven intersection safety improvement
- Reduce number of collisions
- Reduce the severity of collisions and associated fatalities/injuries
- Improved geometry and lower speeds through the intersection

Improves Operations

- Reduce average vehicle delay
- Traffic does not stop most of the time
- Can improve overall operation of roadway
- Local example – Route 217/Hollister Avenue, Goleta
  - Dual roundabouts at Route 217 on- and off-ramps
  - Replacement of bridge over Hollister Avenue avoided
  - Increasing number of lanes on Hollister Avenue avoided

Accommodate Larger Vehicles

A truck apron accommodates vehicles with large turning radii, such as buses, trucks, tractor trailers, farm equipment, and emergency vehicles.

Maintenance Needs

- Signals require routine inspection
- Signals require a human response for a malfunction
- Landscape maintenance cost of a roundabout, is less than the lifetime maintenance cost for a signal

Sustainability

Supports Santa Barbara County Air Quality Program:

- Reduce Carbon Monoxide Emissions by 32%
- Reduce Nitrous Oxide Emissions by 34%
- Reduce Carbon Dioxide Emissions by 37%
- Reduce Hydrocarbon Emissions by 42%
- Reduce Fuel Consumption by 30%

Roundabouts on High Speed Roadways

Successfully used on high speed roadways in California, Kansas and Washington

Route 138/47th St. Palmdale, CA - 2009

Route 169, Garnett, KS - 2006

K-68 & Old K.C. Road , North of Paola, KS – 2001

SR 203/124th St., near Duvall, WA - 2004

Roundabouts on High Speed Roadways

Treatments to Transition to Roundabout

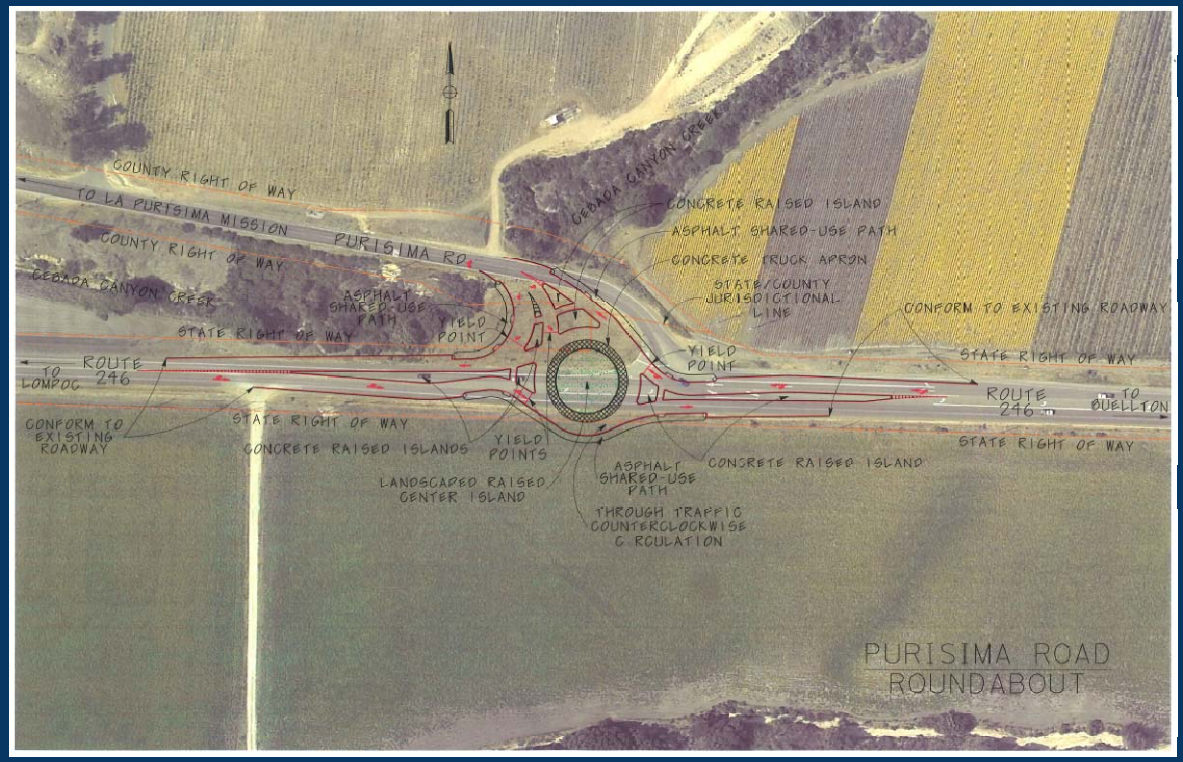
- Signing and Markings
- Long Splitter Islands
- Curvature on Approaches

SR 246/Purisima Road Safety Improvement Project

- *Need:* Collision rate at intersection is four times average
- *Purpose:* Eliminate potential of broadside collisions and reduce the severity of collisions
- *Solution:* The roundabout is the appropriate improvement to address the patterns and severity of collisions occurring today and anticipated over the design life of this project

SR 246/Purisima Road Safety Improvement Project

Aerial view of SR 246 and Purisima Rd. Proposed Roundabout Design



SR 246/Purisima Road Safety Improvement Project

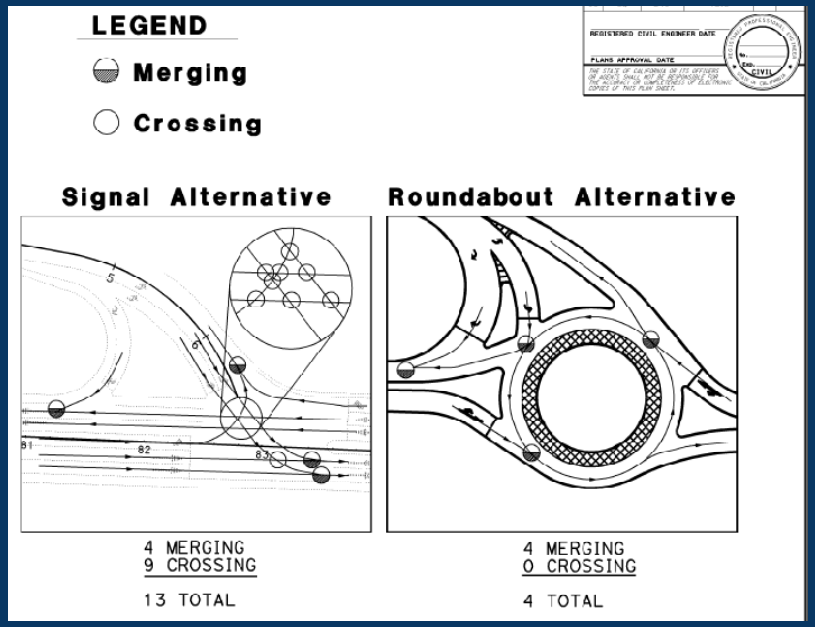
Roundabouts Compared to Signalized Intersection

Safety:

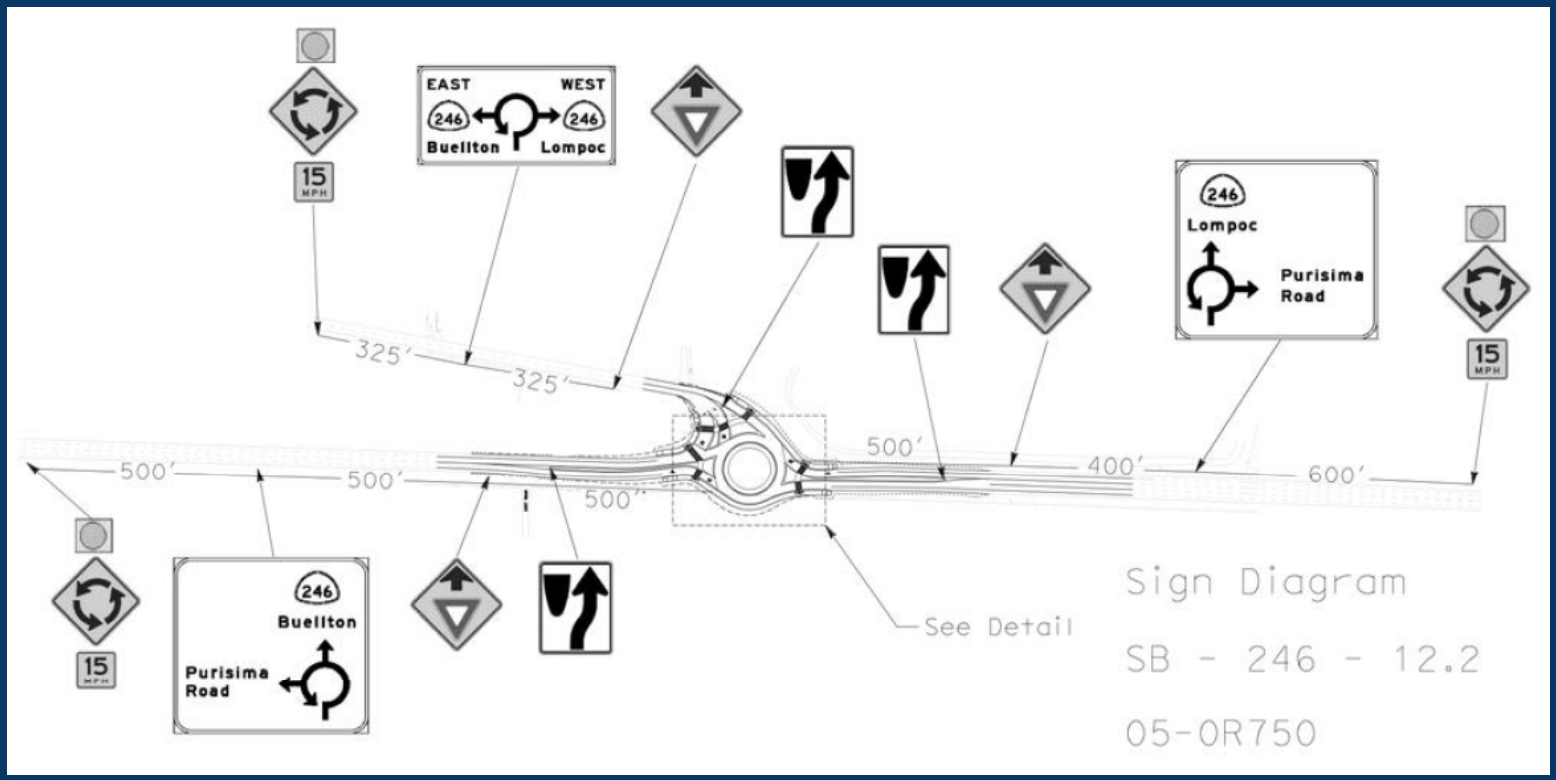
- Reduces points of conflict from 13 to 4
- Eliminates crossing conflicts entirely

Operations:

- By 2035 traffic volumes are expected to double
- LOS A/B w/ roundabout



SR 246/Purisima Road Safety Improvement Project



SR 246/Purisima Road Safety Improvement Project

Schedule:

- Advertise for Bids: May 2011
- Construction Complete: Spring 2013

Cost: $2.6 million

Public Outreach:

- Pubic information meetings held July 2008 and April 2009 in Lompoc
- Additionally met with groups including Farm Bureau
- Potential for driver education

SR 154/SR 246
Safety Improvement Project

Project Purpose, Need, and Status

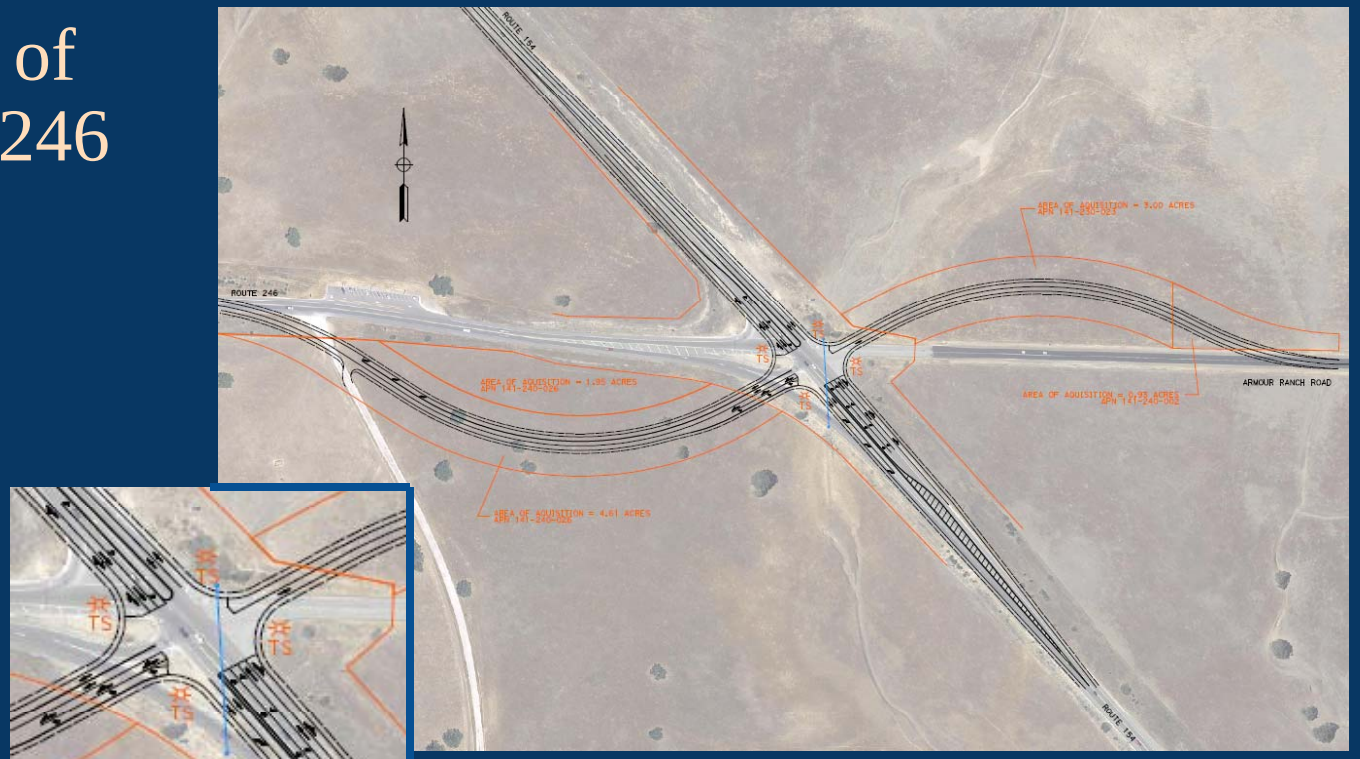
- *Need*: Collision rate is 2.4 times state average
- *Purpose:* Eliminate potential for broadside collisions, and reduce severity of collisions
- *Status:* Project is in the preliminary design and environmental study phase (PA&ED)
- *Solution:* Signalization and roundabout alternatives considered

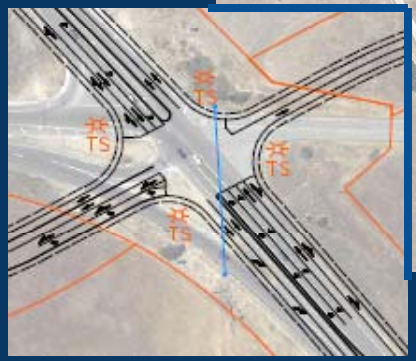
SR 154/SR 246
Safety Improvement Project

Aerial view of SR 154/SR 246 Proposed Roundabout Design

SR 154/SR 246
Safety Improvement Project

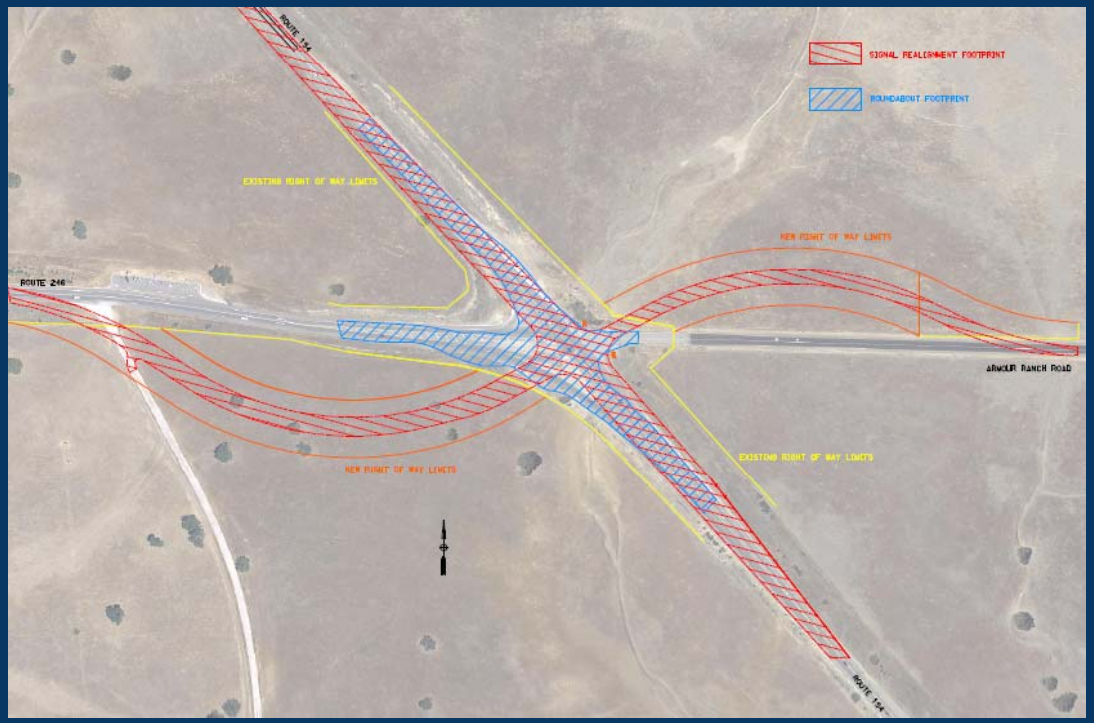
Aerial view of SR 154/SR 246 Proposed Signalized Intersection Design





SR 154/SR 246
Safety Improvement Project

Comparison of alternative footprints



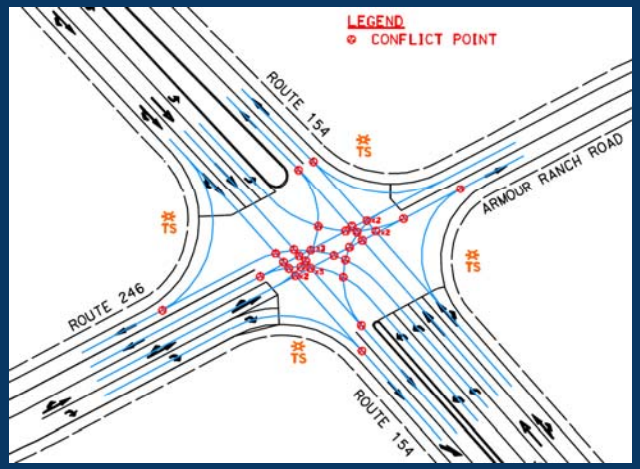
SR 154/SR 246
Safety Improvement Project

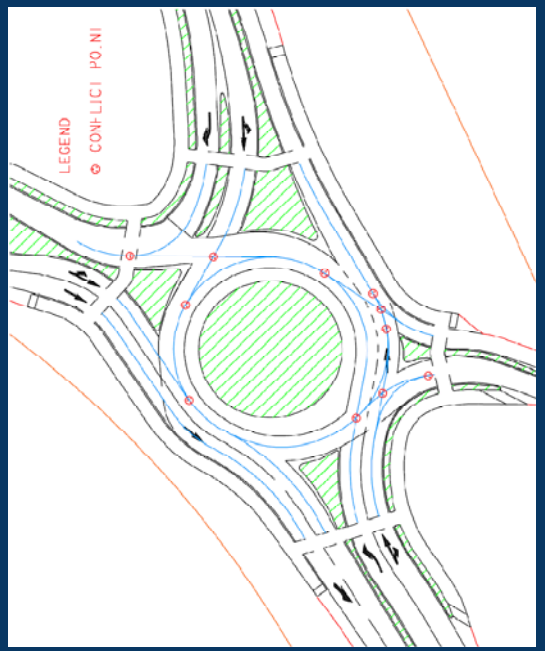
Safety:

- Reduces conflict points from 38 to 11
- 4 crossing conflicts

Operations:

- 2035 traffic volumes will nearly double current volumes
- Roundabout LOS A/A
- Signal LOS B/C





SR 154/SR 246
Safety Improvement Project

Schedule:

- Complete Environmental/Engineering Studies
  - October 2011–2013 based on impact avoidance and public input
- Construction Complete: Fall 2015 – 2017

Cost:

- Roundabout $3.5 million
- Signal $5.0 million

Public Outreach

- Public information meeting June 2011
- Potential for driver education

For More Information

Project information on Caltrans District 5 website:

http://www.dot.ca.gov/dist05/projects/

or contact

Paul Martinez
Project Manager
(805) 549-3407
paul_martinez@dot.ca.gov